

REMARKS

This Amendment is submitted in reply to the non-final Office Action mailed on January 28, 2007. No fee is due in connection with this Amendment. The Director is authorized to charge any fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 112701-530 on the account statement.

Claims 1-19 are pending in this application. In the Office Action, Claims 1-6 and 17-18 are rejected under 35 U.S.C. §112, second paragraph; Claims 1-3, 6 and 14-19 are rejected under 35 U.S.C. §102; and Claims 5, 7-16 and 19 are rejected under 35 U.S.C. §103. In response, Claims 1, 7 and 17 have been amended, and Claims 6 and 15 have been canceled. In view of the amendments and/or for at least the reasons set forth below, Applicants respectfully submit that the rejections should be withdrawn.

In the Office Action, Claims 1-6 and 17-18 are rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Patent Office alleges that the phrase "less than 10% of phosphorus that is present in the biomass is present in the carrier oil" is unclear. The Patent Office further asserts that it is not clear whether the term phosphorus refers to elemental phosphorus, inorganic phosphorus, organic phosphorus or a combination of these.

Applicants respectfully disagree and submit that the term "phosphorus" is clear to the skilled artisan in view of the ordinary meaning of the term "phosphorus" and its use in the specification. Applicants have not defined the term "phosphorus" as being limited to elemental phosphorus, inorganic phosphorus or organic phosphorus. In view of any specific definitions, the skilled artisan would understand the term "phosphorus" to be the type of phosphorus that is present in a biomass. This phosphorus could be any form that is capable of residing in the biomass whether that form is elemental phosphorus, inorganic phosphorus or organic phosphorus. As a result, the skilled artisan would understand the metes and bounds of the term "phosphorus" in view of the specification. Based on at least these noted reasons, Applicants believe that Claims 1-6 and 17-18 fully comply with 35 U.S.C. §112, second paragraph.

Accordingly, Applicants respectfully request that the rejection of Claims 1-6 and 17-18 under 35 U.S.C. §112 be withdrawn.

In the Office Action, Claims 1-3, 6 and 14-19 are rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 6,117,905 to Higashiyama et al. ("*Higashiyama*"). Claims 1-3, 6 and 14-19 are rejected under 35 U.S.C. §102 as anticipated by WO 99/65352 to Beudeker et al. ("*Beudeker*"). Applicants respectfully disagree with and traverse these rejections for at least the reasons set forth below.

Applicants have amended independent Claims 1 and 7 to recite the elements of dependent Claims 6 and 15, respectively. Amended Claims 1 and 7 recite, in part, a stable oil that contains no more than 10% by weight of long-chain polyunsaturated fatty acids (LC-PUFAs). Examples of the LC-PUFAs include arachidonic acid, dihomogammalinolenic acid, eicosapentaenoic acid or docosahexaenoic acid.

Independent Claims 1 and 7 also recite, in part, one or more long-chain polyunsaturated fatty acids from a biomass obtained from the culture of a microorganism incorporated into a carrier oil. An advantage of the present claims is that the carrier oil can directly be used to extract the long-chain polyunsaturated fatty acids from the biomass instead of using organic solvents such as hexane. In alternative embodiments, the carrier oil can be high oleic acid sunflower oil (HOSFO), sunflower oil (SFO), soya bean oil, palm olein or a medium-chain triacylglycerol (MCT, containing essentially triacylglycerols of saturated C₈-C₁₀ fatty acids), which are separate from the biomass oils that originate from the biomass containing the particular long-chain polyunsaturated fatty acids. In contrast, Applicants respectfully submit that the cited references fail to disclose or suggest every element of the present claims.

Higashiyama fails to disclose or suggest a stable oil that contains no more than 10% by weight of long-chain polyunsaturated fatty acids as required by Claims 1 and 7. *Higashiyama* also fails to disclose or suggest one or more long-chain polyunsaturated fatty acids from a biomass obtained from the culture of a microorganism incorporated into a carrier oil as required by Claims 1 and 7. Instead, *Higashiyama* is entirely directed to an edible oil originating from microorganisms that contains 20% by weight or more of arachidonic acid. See *Higashiyama*, column 2, lines 56-64. As arachidonic acid is a long-chain polyunsaturated fatty acid, *Higashiyama* discloses an edible oil that contains 20% by weight or more of long-chain

polyunsaturated fatty acids. Moreover, *Higashiyama* does not disclose or suggest any separate carrier oil used to receive the long-chain polyunsaturated fatty acids from the biomass in accordance with the present claims.

Similarly, *Beudeker* fails to disclose or suggest a stable oil that contains no more than 10% by weight of long-chain polyunsaturated fatty acids as required by Claims 1 and 7. *Beudeker* also fails to disclose or suggest one or more long-chain polyunsaturated fatty acids from a biomass obtained from the culture of a microorganism incorporated into a carrier oil as required by Claims 1 and 7. *Beudeker* is directed to a marine feed composition comprising microbially derived arachidonic acid (ARA). See *Beudeker*, page 3, line 24 to page 4, line 7. The oil comprising the ARA originates from microorganisms and contains a higher amount by weight of arachidonic acid (i.e. LC-PUFAs) than that required by Claims 1 and 7. Moreover, *Beudeker* does not disclose or suggest any separate carrier oil used to receive the long-chain polyunsaturated fatty acids from the biomass in accordance with the present claims.

For at least the reasons discussed above, Applicants respectfully submit that Claims 1 and 7 and Claims 2-3, 6 and 14-19 that depend from Claims 1 and 7 are novel, nonobvious and distinguishable from the cited references. Accordingly, Applicants respectfully request that the rejections of Claims 1-3, 6 and 14-19 under 35 U.S.C. §102 be withdrawn.

In the Office Action, Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Higashiyama*. Claim 12 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Kyle* in view of U.S. Patent No. 4,465,699 to Pagliaro et al. ("*Pagliaro*") and *Higashiyama*. Applicants respectfully submit that the patentability of Claims 1 and 7 as previously discussed renders moot the obviousness rejections of Claims 5 and 12 that depend from independent Claims 1 and 7. In this regard, the cited art fails to teach or suggest the elements of Claims 5 and 12 in combination with the novel elements of Claims 1 and 7.

Claims 7-11, 13-16 and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over *WO 96/21037* to *Kyle* ("*Kyle*") in view of *Pagliaro*. Applicants respectfully disagree with and traverse this rejection for at least the reasons set forth below.

Independent Claim 7 recites, in part, bringing a carrier oil into contact with a biomass obtained from the culture of a microorganism containing one or more long-chain polyunsaturated

fatty acids. In contrast, Applicants respectfully submit that the cited references are deficient with respect to the present claims.

Kyle fails to disclose or suggest bringing a carrier oil into contact with a biomass obtained from the culture of a microorganism containing one or more long-chain polyunsaturated fatty acids as required by Claim 7. Applicants respectfully submit that *Kyle* recovers biomass oil by using conventional methods of extraction with a solvent such as hexane or supercritical fluids. See *Kyle*, page 13, lines 15-21 and page 15, lines 1-8. The extracted biomass oils are then removed from the solvent in another step to form crude oils that can be used directly or refined for administering to humans. See *Kyle*, page 15, line 21. *Kyle* fails to disclose any step involving bringing a carrier oil into contact with a biomass obtained from the culture of a microorganism containing one or more long-chain polyunsaturated fatty acids in accordance with Claim 7.

Pagliaro fails to remedy the deficiencies of *Kyle*. For example, *Pagliaro* fails to disclose or suggest bringing a carrier oil into contact with a biomass obtained from the culture of a microorganism containing one or more long-chain polyunsaturated fatty acids as required by Claim 7. Instead, *Pagliaro* is entirely directed to a process for producing a decaffeinated vegetable material such as coffee or tea in aqueous extract or solid form, which not only fails to disclose Claim 7 but actually teaches away from same. In fact, *Pagliaro* fails to disclose or suggest any type of microorganisms or microorganism containing one or more long-chain polyunsaturated fatty acids.

According to an embodiment of the present invention, a separate carrier oil is directly used to selectively displace biomass oil (not unwanted impurities) from a milled biomass obtained from the culture of a microorganism. One or more LC-PUFAs from the biomass are incorporated into the carrier oil. This enables the separation of the oil from the biomass residue, for example, when the resulting biomass-oil slurry is squeezed in a press as an alternative to using a solvent extraction to obtain the oils. Consequently, although the pressed biomass cake still retains some oil, it has a very low content of LC-PUFA. The stable oil obtained by the claimed process is clean and does not need to be subjected to further purification in contrast to the oils obtained through the solvent extractions. In addition, the LC-PUFA is protected from oxidation by antioxidants present in the carrier oil.

For at least the reasons discussed above, the combination of *Kyle* and *Pagliaro* do not teach, suggest, or even disclose all of the elements of independent Claim 7 and Claims 8-11, 13-16 and 19 that depend from Claim 7, and thus, fail to render the claimed subject matter obvious. Accordingly, Applicants respectfully request that the obviousness rejections with respect to Claims 5, 7-16 and 19 be reconsidered and the rejections be withdrawn.

For the foregoing reasons, Applicants respectfully request reconsideration of the above-identified patent application and earnestly solicit an early allowance of same. In the event there remains any impediment to allowance of the claims that could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Respectfully submitted,

BELL, BOYD & LLOYD LLC

BY 

Robert M. Barrett
Reg. No. 30,142
Customer No. 29157
Phone No. 312-807-4204

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